

National Climatic Data Center

DATA DOCUMENTATION

FOR

DATASET 9684 (DSI-9684)

ALPEX

February 25, 2004

National Climatic Data Center
151 Patton Ave.
Asheville, NC 28801-5001 USA

Table of Contents

Topic	Page Number
1. Abstract.....	3
2. Element Names and Definitions:	3
3. Annex A.....	10
4. Annex B.....	23
5. Start Date.....	47
6. Stop Date.....	47
7. Coverage.....	47
8. How to order data.....	47
9. Archiving Data Center.	47
10. Technical Contact.....	47
11. Known Uncorrected Problems.....	48
12. Quality Statement.....	48
13. Essential Companion Data Sets.....	48
14. References.....	48

1. Abstract: The general objective of the Alpine Experiment (ALPEX) was to determine the airflow and mass field over and around mountain complexes under various synoptic conditions. The project has focused on circulations due to wind forcing, including storm surges in the Adriatic and western Mediterranean Sea. The area of Europe involved was from 5 degrees west to 30 degrees east Longitude and from 38 degrees north to 50 degrees north latitude. This project was in direct support of the World Meteorological Organization with 20 nations taking part in the project. The specific tasks of the project were:

- 1) To investigate the mechanism of cyclogenesis in the lee of mountains
- 2) To study local mountain wind phenomena such as FOHN, MISTRAL and Bora
- 3) To determine the total drag of a mountain complex (Alps)
- 4) To measure the vertical flux of horizontal momentum in lee-waves
- 5) To observe orographic influences on precipitation, floods, and heat budget

Information can be provided for:

- 1) ALPEX quick-look datasets in Microfilm or Digital forms
- 2) Special platform data (research ACFT data)
- 3) Level II-B (Dropwindsonde data)
- 4) Level III-B (ALPEX analyses data)
- 5) Special satellite data
- 6) U.S. National holding data

2. Element Names and Definitions:

Tape Header File

The tape header file will contain general information about the contents of the data tape written in plain language. The information will be in a sequence of 80 character positions per print line, so that the information can be easily compiled from punched cards. The tape header file will also contain table, which provide an explanation of various codes used in the data records of the data files. These tables are contained in Annex A.

The layout of the tape header file is illustrated below:

Character Positions	Descriptions
---------------------	--------------

:
:

1-6	Project name, left-justified, blank-filled (ALPEXb)
7-10	Code figure for data source (See Annex A, Table 26)
11-12	J1, J1 - year (beginning)
13-14	M1, M1 - month (beginning)
15-16	Y1, Y1 - year (beginning)
17-18	G1, G1 - hour (GMT) (beginning)
19-20	J2, J2 - year (ending)
21-22	M2, M2 - month (ending)
23-24	Y2, Y2 - day (ending)
25-26	G2, G2 - hour (GMT) (ending)
27-80	Blanks (fill-characters)
81-160 161-240	Name of office and country producing the tape
241-320 321-400 401-480	Address of office producing the tape
481-560	Name of scientist producing the data (optional; blank-filled if not used)
561-640	Date the tape was written
641-720	Translation list corresponding to the following character list: 0123456789=>b/STUVWXYZ, (-JKLMNOPQR*];+ABCDEFGHI.) [<, where b represents code, etc.)
721-800	Characteristics of the tape (number of tracks, density, recording code, etc.)
801-880 881-960 961-1040 1041-1120 1121-1200	Plain language description of the contents of the tape, by data types.
1201-to as needed	Tables of codes as shown in Annex A; formats of each logical record as written on tape (e.g., for rawinsonde report identification record, the format is A1, A2, A5, A4, 2F5.2, 6A2, A3); A3); followed by any plain language comments

As many card images (80-character positions) as necessary are used to include all of the tables. **The description of each table should be as follows:**

Card Column	Definition
1-5	Code figure (left blank, if continuation of the description)
6	Blank
7-80	Description of code figure (continued on next card, if necessary)

All tables and code figures should be arranged in numerical order. The tables will be followed by description of the formats used to write the logical records on tape. Finally, any comments which would help the data tape users should be included as plain language information.

The idea for the tape header file is that it may be printed out as a computer listing and since the first card image (character positions 1-80) is in a strict format, it can be used for file management purposes in computer operations.

Data files:

:

Each data file contains one or more physical records of observed or derived data. A physical record is made up of 80 logical records, each consisting of 37 characters. Thus the physical record length is 2960 characters. An individual observation consists of two or more logical records, depending on the type and amount of data contained in the observation.

Data file structure:

The data files are recorded on tape in a specific order: all data files corresponding to a given 6-hour time period are grouped together, followed by the data files for the next 6-hour time period, and so on. The order of the data files within a 6-hour time period is the same as the numerical order shown in Table 1, Annex A. The 6-hour time periods are centered on the major synoptic observing times shown below.

Time of First Data	Major Synoptic Time	Time of Last Data
2101	0000	0300
0301	0600	0900
0901	1200	1500
1501	1800	2100

A group of data files for a given 6-hour period will not be split between two magnetic tapes.

The first logical record of a data file is a file header record, which contains information on the contents of the data file. The format of the file header record is illustrated below:

File Header Record

Parameter	Number of Characters	Character Positions	Remarks
Identification	1	1	H=identification character
Data format index	2	2-3	See Annex A, Table (27)
Year	2	4-5	82 = 1982
Month	2	6-7	01-12 = January-December
Day	2	8-9	01-31
Hour	2	10-11	00, 06, 12 or 18 GMT
Unused	2	12-13	`
Data source indices	20	14-33	See Annex A, Table (1)
Unused	4	34-37	

Year, month, day and hour define the major synoptic time of the data file. The data sources indices define the types of observation within the data file. Up to ten data source indices may be included (characters are left-justified, and unused positions are zero-filled).

In general, a data file contains only one type of data for a 6-hour period. However, certain data types because of their similarities are grouped together in the same files. These combinations, using the code figures in Table 1, Annex A, are listed below.

:
:

Code Figures	Data Type
11,12	Rawinsonde, Pilot
21,23,24	ASDAR, AIREP, CODAR
31,32	Manual surface land, automated surface land
33,34,35	Fixed ship surface, mobile ship surface, environmental buoy
71,72	BATHY, TESAC

The logical records of the observations (reports) follow immediately after the file header record. The first logical record of each report is the report identification record. The first character of the identification record is always the unique character-asterisk (*). The number (N) of logical records required to contain the complete report is contained in the last three characters of the identification record. The remaining N-1 logical records of a report contain the meteorological and oceanographic parameters and associated quality control flags, where appropriate. The formats of the logical records are described below. The logical records of a data file are blocked into physical records containing 80 logical records. An individual report may span two or more physical records.

Data Organization within files:

Within each data file, a given type of data is usually sorted and ordered according to the following levels:

(1) First level of sorting: by latitude, from south to north, in ten degree intervals (positive values refer to north latitude).

30.00 to 40.00
40.01 to 50.00
50.01 to 60.00

(2) Second level of sorting: by longitude, from west to east, in ten degree intervals (negative values refer to west longitude; positive values refer to east longitude).

-30.00 to -20.00
-19.99 to -10.00
- 9.99 to 0.00
0.01 to 10.00
10.01 to 20.00
20.01 to 30.00

(3) Third level of sorting: by time increasing, during the 6-hour time period, within each ten degree latitude by ten-degree longitude area.

The three levels of sorting refer in general to surface-based, synoptic-type data such as surface, ship, upper-air and aircraft reports. In the case of some types of satellite data such as satellite temperature and humidity profiles, which are more synoptic in character, the data for a 6-hour time period are sorted according to time increasing.

Data Conventions:

A logical end-of-file, consisting of an asterisk (*) in the first character position followed by 36 nines in the remaining positions of the logical record, follows the last data record in the data file. A sufficient number of

:
:

logical records filled with nines are included to complete the physical record.

If parameter values are missing, a sufficient number of nines, signed negative, are used to fill the parameter field. If only one character position is allocated for a given parameter, a single nine is used to fill in.

For negative values, the first or left-most character position is used for the minus sign. The remaining character positions are used for the parameter value. For positive values, all of the character positions are used for the parameter value (plus sign is not required).

If all of the allocated character positions are not required, the parameter value is stored right-justified and zero filled where necessary.

Character positions specified as unused are filled with blanks.

Description of tape formats:

The tape formats described in this section were designed so that similar types of observations could be recorded on magnetic tape in the same format. The use of data source indices permits the identification of the source of each type of observation.

Upper-air Format:

An upper-air report consists of a variable number of logical records. After the identification record, each additional logical record contains information for one upper-air level. As many logical records as needed are included to record the information for all available upper-air levels. Details of the upper-air format are provided in Table 1, Annex B.

The following types of ALPEX observation are recorded in the upper-air format: rawinsonde, pilot wind, NAVAID upper-air, and aircraft dropwindsonde.

Aircraft Format:

An aircraft report consists of at least three logical records. After the identification record, the second logical record always contains meteorological data other than wind data. The third logical record contains wind data for up to two positions. If the aircraft report contains wind data for more than two positions, additional logical records containing up to two winds per logical record are included in the report. In the case of observations telecommunicated in the AIREP code, which contain information on cloud amounts and heights of bases or tops of clouds, an optional data record is always the last logical record in the report. Details of the aircraft format are provided in Table 2, Annex B.

The following types of ALPEX observations are recorded in the aircraft format: ASDAR, AIDS, AIREP and CODAR.

Surface Land/Marine Format:

A surface report consists of at least three logical records. After the identification record, two mandatory surface data records are always included. In the case of telecommunicated observations which contain supplementary

:
:

cloud-data groups (e.g., 8-groups in the WMO SYNOP and SHIP codes), the cloud data are included in an additional logical record. This logical record is always included in an additional logical record. This logical record is always included as the fourth record of the surface report. In the case of surface marine observations, an additional data record for marine data is included in the report. This data record is always the last record of the surface report (fourth or fifth record, depending on the availability of supplementary cloud data). Details of the surface format are provided in Table 3, Annex B.

The following types of ALPEX observations are recorded in the surface format: SYNOP (manual and automatic) and SHIP (fixed, mobile, and environmental buoys).

Satellite Sounding Format:

A satellite sounding report consists of a variable number of logical records. After the identification record, a second logical record containing miscellaneous information reported in the WMO SATEM code is always included. Each additional logical record contains a specific type of information (thickness, precipitable water or mean temperature) for up to two vertical layers. The first two character positions of each logical record contain information on the types of data. As many logical records as needed are included to record the available information. Details of the satellite sounding are provided in Table 4, Annex B.

Satellite Wind or Sea Surface Temperature Format:

A satellite wind or sea surface temperature report consists of two or more logical records. After the identification record, each additional logical record contains information for one wind report or two sea surface temperature reports. As many logical records as needed are included to record the available information. Details of the satellite wind or sea surface temperature format are provided in Table 5, Annex B.

Oceanographic Format:

An oceanographic report consists of a variable number of logical records. After the identification record, five additional logical records containing miscellaneous identification and environmental data are always included. Subsequent logical records contain oceanographic parameter information for two or three ocean depths, depending on the type of data (BATHY or TESAC). As many logical records as needed are included to record the available information. Details of the oceanographic format are provided in Table 6, Annex B.

Drifting Buoy Format:

A drifting buoy report consists of two or more logical records. The drifting buoy format permits the recording of reports containing surface data alone, sub-surface data alone, or both types of data. The first logical record is always the identification record. For drifting reports containing surface data, the second logical record always are included to record the available sub-surface information. For drifting buoy reports containing only sub-surface data, the second and subsequent records are used to record all available sub-surface data. Details of the drifting buoy format are provided in Table 7, Annex B.

:
:

Daily Precipitation Total and Snow Data Format:

A daily precipitation and snow report consists of two logical records, after the identification record, a second logical record is always included, containing precipitation and snow data. Details of this format are provided in Table 8, Annex B.

Three-hourly Precipitation Data Format:

A 3-hourly precipitation data report consists of two logical records. After the identification record, a second logical record is always included, containing 3-hourly precipitation data for a 24-hour period. Details of this format are provided in Table 9, Annex B.

Soil Temperature and Moisture Format:

A soil temperature and moisture data report consists of three or more logical records. After the identification record, one logical record for soil temperatures and one logical record for soil moisture values for up to six depths are included for each observation time during the day. Details of this format are provided in Table 9, Annex B.

Formats for Other Types of Level II Data:

There is a need for the development of tape formats for ALPEX Level II data, which will not be merged with the GTS-type data at the International ALPEX Data Centre (IADC). Examples are microbargraph data, lidar and acoustic sounder data, and radar data. These data sets are expected to be produced by Special ALPEX Data Centres (SADC's) or National ALPEX Data Centres (NADC's). Therefore, these centres should develop suitable formats for the recording of their data. As much as possible, the structure of the formats should be similar to those in Annex B (i.e., logical record length of 37 characters, first logical record containing identification information, etc.). The design of the formats should be coordinated with the WGADM.

Annex A
Table of Codes

Table 1
Data Source Index

Code Figure	Description
11	Rawinsonde data
12	Pilot wind data
14	NAVAID sounding data
15	Aircraft dropwindsonde data
21	Aircraft data - ASDAR
22	Aircraft data - AIDS cassette
23	Aircraft data - conventional (AIREP)
24	Aircraft data - conventional (CODAR)
31	Manual surface land observation (SYNOP)
32	Automatic surface land observation (SYNOP)
33	Surface observation from fixed ship (SHIP)
34	Surface observation from mobile ship (SHIP)
35	Surface observation from environmental buoys
41	Satellite sounding data
61	Satellite wind data
63	Satellite sea surface temperature data
71	Oceanographic data (BATHY)
72	Oceanographic data (TESAC)
81	Drifting buoy data
91	Precipitation and snow data
92	Soil temperature and moisture data
93	Surface-based radiation data

Table 2
Instrument type

Code Figure	Description
00	Constant Level Balloon
01	Finland-Vaisala
02	Federal Republic of Germany - Graw H.50 (corrected)
03	France - METOX
04	German Democratic Republic - Freiberg
05	Japan - Code Sending
06	Portugal
07	U.K. - KEW Mark II-B
08	U.S.A. - ESSA External Thermistor

:
:

09	U.S.A. - ESSA External Thermistor (plateau stations)
10	U.S.A. - AN/AMT-4 Military External Thermistor
11	U.S.A. - ESSA 403 MHz Duct Type (WBAN corrections applied at station)
12	U.S.A. - ESSA 403 MHz Duct Type (WBAN corrections not applied at station)
13	U.S.S.R - RKZ-1
14	U.S.S.R - RKZ-5
15	U.S.A. - Omega Windfinding Sonde (aircraft dropwindsonde)
16	NAVAID Sonde - TRACOR/VAISALA
17	U.K. - Mark III Sonde
18	Indian Audio-Modulated Radiosonde
19	VIZ 1292, 1220-401, 1393, 1392-401
20	VIZ RD 1680S
21	VIZ LOCATE Omega
22	METEORIT I
23	METEORIT II
24	DFR MARS 4
25	AUTOVOX 1680 IP & TR
26	"SUISSE" Type
27	MESURAL
28	Plessey WF3
29	Plessey WF100-4
30	Optical Theodolite
31	SHIP Surface Wind Speed Estimated (Real-Time collection)
32	SHIP Surface Wind Speed Obtained from Anemometer (Real-Time collection)
36	SHIP Surface Wind Speed Estimated (Delayed collection)
37	SHIP Surface Wind Speed Obtained from Anemometer
50	NOAA-6 TOVS
51	NOAA-7 TOVS
55	NOAA-6 AVHRR
56	NOAA-7 AVHRR
69	METEOSAT-2 Radiometer
70	Bucket Thermometer
71	Thermometer in Condenser Intake on Steam Ships, or Inlet or Engine Cooling System on Motor Ships
41	Float type autographic recorder
42	Tipping bucket type autographic recorder
43	Weighting type autographic recorder
44	Precipitation measured by graduated measuring cylinder
45	Precipitation measured by graduated dip rod
46	Precipitation measured by weighing
99	Not known or not available
72	Trailing Thermometer
73	Hull Contact Sensor
74	"Through Hull" sensor
75	Radiation Thermometer
76	Bait Tanks Thermometer
80	EEC WF 100-4 (Radar)
81	METOX (Radiowind)
99	Unknown

Table 3

:
:

Type of Level in Upper Air Data

Code Figure	Description
01	Surface level but not standard (pressure or height) level
02	Significant temperature or humidity level but not standard pressure level
03	Tropopause level but not standard pressure level
04	Significant wind level but not standard (pressure or height level)
05	Maximum wind level but not standard (pressure or height level)
10	Standard (pressure or height) level only
11	Surface level and standard (pressure and height) level
12	Significant temperature or humidity level and standard pressure level
13	Tropopause level and standard pressure level
14	Significant wind level and standard (pressure or height) level
15	Maximum wind level and standard (pressure or height) level
25	Cloud level

Table 4
Quality Control Marks for Upper Air Data

(a) For Rawinsonde Pilot and Aircraft Dropwindsonde Data	
IH Code Figure	Description
0	Horizontal control check was not made
1	Value found correct during the horizontal control check
2	Value found suspect during horizontal control check
3	Value found erroneous during horizontal control check
4	Observed value was changed during the horizontal control check
5	Horizontal control check made; action unrecorded but most likely value entered
6	Original value missing; reconstituted value inserted
9	Original value missing; no control check made
IV Code Figure	Description
0	Vertical control check was not made
1	Value found correct during vertical control check
2	Value found suspect during vertical control check
3	Value found erroneous during vertical control check
4	Observed value found erroneous during vertical control check; reconstituted value inserted
5	Vertical control check made; action unrecorded but most likely value entered
6	Original value missing; reconstituted value inserted
7	Original value missing; value assigned
8	Value found erroneous during check against certain limits
9	Original value missing; no control check made
(b) For Aircraft Flight Level Data (IL, IV = check against certain limits, vertical check)	
IL Code Figure	Description

:
:

0	Check against certain limits wsa not made				
1	Value found correct during check against certain limits				
2	Value found suspect during against certain limits				
3	Value found erroneous during check				
4	Observed value found erroneous during check against certain limits; reconstituted value inserted				
5	Check against certain limits made; action unrecorded but most likely value entered				
6	Original value missed; reconstituted value inserted				
9	Original value missing; no control check made				
(c) For NAVAID upper Air Data (IH, IV = quatitative estimate of RMS error for given parameter; vertical averaging interval used to achieve the RMS error)					
IH Code Figure		Quantitative Estimate of RMS Error			
0		Unknown or not applicable			
		V (mps)	Z (gpm)	T (°C)	RH(%)
1		<0.5	<20	<0.2	<1.0
2		0.6-1.6	20-66	0.2-0.6	1.0-3.3
3		1.7-3.3	67-134	0.7-1.3	3.4-6.7
4		3.4-5.5	135-221	1.4-2.2	6.8-11.0
5		5.6-8.1	222-325	2.3-3.2	11.1-16.2
6		8.2-11.1	326-445	3.3-4.4	16.3-22.3
7		11.2-14.5	446-582	4.5-5.8	22.4-29.1
8		14.6-18.3	583-733	5.9-7.3	29.2-36.7
9		18.4-22.4	734-899	7.4-8.8	36.8-44.9
IV Code Figure		Vertical Interval (m)			
0		Unknown or not applicable			
1		<100			
2		101-330			
3		331-670			
4		671-1100			
5		1101-1620			
6		1621-2227			
7		2228-2909			
8		2910-3666			
9		3667-4495			

Table 5
Turbulence (Modified WMO Code Table 0359)

Code Figure	Description
0	None
1	Moderate, in or out of clouds
2	Severe, in or out of clouds
3	Moderate, out of clouds
4	Severe, out of clouds
5	Moderate, in clouds
6	Severe, in clouds
9	Unknown

Table 6

:
:

Icing

Code Figure	Description
0	None
1	Moderate
2	Severe
9	Unknown

Table 7
Weather Phenomena (AIREP Reports)

Code Figure	Description
0	Rain
1	Snow
2	Freezing rain
3	Funnel cloud
4	Thunderstorm
5	Front
8	None
9	Unknown

Table 8
Cloud Amount and Base or Top (AIREP Reports)

Code Figure	Description
0	Scattered, base
1	Broken, base
2	Continuous, base
3	Cumulonimbus, base
4	Scattered, top
5	Broken, top
6	Continuous, top
7	Cumulonimbus, top
8	None
9	Unknown

Table 9
Quality Control Marks for Parameters in Surface Land/Marine Reports and Drifting Buoy Reports

Code Figure	Description
0	Quality control was not made
1	Observed value found correct during quality control check
2	Observed value found suspect during quality control check
3	Observed value found erroneous during quality control check
4	Observed value found erroneous during quality control check; reconstituted value inserted
5	Quality control check made; action unrecorded but most likely value entered
6	Original value missing; reconstituted value inserted
7	Value consistent with present and past observation (applicable to ship position only)
8	Value is not consistent with present and past observations

:
:

	(applicable to ship position only)
9	Observed value missing; no quality control made

Note: Parameters are wind, sea level pressure, air temperature, dew point depression, pressure tendency, sea surface temperature and ship position.

Table 10
Pressure Code Indicator

Code Figure	Description
0	Sea level pressure
1	Station pressure
2	Pressure at 1000 gpm
3	Pressure at 2000 gpm
4	Pressure at 3000 gpm
5	Geopotential of 1000 mb
6	Geopotential of 850 mb
7	Geopotential of 700 mb
8	Geopotential of 500 mb
9	Unknown

Table 11
Quality Control Marks for Surface Land/Marine Reports and Drifting Buoy Reports

Code Figure	Description
0	Quality control was not made
1	The report was found correct during control
2	The report was found suspect during control
3	The report was found erroneous during control
4	At least one parameter was found erroneous during control (suppressed or corrected)
5	Control was made; action uncertain but most likely report was entered

Note: Quality control marks are for time consistency, internal consistency, horizontal consistency, climatological limits, and physical limits.

Table 12
Time period Indicator for Pressure Tendency, Precipitation, and Maximum Temperature

Code Figure	Description
1	Value for 3 hours
2	Value for 6 hours
3	Value for 9 hours
4	Value for 12 hours
5	Value for 15 hours
6	Value for 18 hours
7	Value for 21 hours
8	Value for 24 hours
9	Value unknown

:
:

Note: User is urged to consult WMO publication No. 306, Volume II, for definition of regional and national practices

Table 13
Type of Satellite Sounding Level

Code Figure	Description
0	Miscellaneous SATEM information (Mandatory record)
1	Layer thickness, between a reference pressure level and a standard isobaric surface (SATEM - Parts A and C)
2	Layer precipitable water, between a reference pressure level and a standard isobaric surface (SATEM - Part A)
3	Layer mean temperature, between two non-standard isobaric surfaces (SATEM - Parts B and D)
4	Layer precipitable water, between two non-standard isobaric surfaces (SATEM - Part B)

Table 14
Time Period of 24 Hrs
Period of Observations

Code Figure	Description
1	2231 GMT f previous day to 0130 GMT
2	0131 GMT to 0430 GMT
3	0431 GMT to 0730 GMT
4	0731 GMT to 1030 GMT
5	1031 GMT to 1330 GMT
6	1331 GMT to 1630 GMT
7	1631 GMT to 1930 GMT
8	1931 GMT to 2230 GMT
9	Information not available

Table 15
Indicator for Data Processing Technique Used by Producer of Satellite Sounding Data

Code Figure	Description		
	X	Y	Z
00	0	0	0
01	0	0	1
02	0	0	1
03	Not Possible		
04	Not Possible		
05	Not Possible		
06	Not Possible		
07	Not Possible		
08	Not Possible		
09	Not Possible		
10	Not Possible		
11	Not Possible		
12	1	1	0
13	1	1	1
14	1	1	2

:
:

15	1	2	0
16	1	2	1
17	1	2	2
18	Not Possible		
19	Not Possible		
20	Not Possible		
21	2	1	0
22	2	1	1
23	2	2	0
24	2	2	0
25	2	2	1
26	2	2	2

Note: the formula for computing the code figure is:

$$\text{Code figure} = 9X + 3Y + Z$$

Where:

X = 0 for no HIRS/2 data available

X = 1 for clear radiances derived from completely clear spots

X = 2 for clear radiances derived from the N* approach

Y = 0 for no HIRS/2 data available (same as X = 0)

Y = 1 when all HIRS/2 channels were used in the retrieval

Y = 2 when the tropospheric HIRS/2 channels were unusable due to clouds and only stratospheric channels were used in the retrieval

Z = 0 when the statistical retrieval method was used

Z = 1 when the minimum information retrieval was used

Z = 2 when the minimum information retrieval was attempted but the statistical retrieval was used

Table 16
Indicator for Data Processing Technique Used by Satellite Data Producer (for tropopause level)

Code Figure	Description
00	Processing technique not specified
01	Statistical regression

Table 18
Indicator for Data Processing Techniques Used by Satellite Data Producers

Code Figure	Description
00	Processing technique not specified
01	Winds: automated cross-correlation system
02	Wind: man-machine interactive system
03	Winds: automated cross-correlation technique and man-machine interactive system
04	Winds: automated cross-correlation technique, with manual quality control
21	Sea surface temperatures: histogram technique
22	Sea surface temperatures: multispectral technique

:

23	Sea surface temperatures: statistical regression using microwave data
----	---

Table 19
Deck Number (IGOSS) for Oceanographic Data

Code Figure	Description
0001	Data obtained from WMO FM 63 BATHY coded message
0002	Data obtained from WMO FM 64 TESAC coded message
0003	Data obtained from oceanographic buoys
0004	Data obtained from processed X-BT archive files
0005	Data obtained from processed M-BT archive files
0006	Data obtained from processed vertical profile data
0007	Data obtained from processed serial depth data

Table 20
Type of Oceanographic Data

Code Figure	Description
1	BATHY - depth, temperature
2	TESAC - depth, temperature, salinity
3	TESAC - depth, current

Table 21
Ocean Data-Acquisition System, Aids and Devices (ODAS) Category Code

Code Figure	Description
1	Mobile ODAS: vessels which are covered by the International Regulations for Preventing Collisions at Sea
2	Mobile OSAS: drifting (free-floating) surface penetrating ODAS
3	Mobile ODAS: drifting (free-floating) sub-surface ODAS
4	Anchored (moored) or bottom-bearing ODAS: surface penetrating ODAS
5	Anchored (moored) or bottom-bearing ODAS: sub-surface ODAS

Table 22
IOC Country Code for Oceanographic Data Processing Purposes

Code Figure	Country	Code Figure	Country
72	Albania	JA	Jamaica
AL	Algeria	49	Japan
08	Argentina	24	Korea, Republic of
09	Australia	52	Lebanon
10	Austria	55	Madagascar
11	Belgium	MS	Malaysia
13	Bolivia	57	Mexico
14	Brazil	MO	Monaco
15	Bulgaria	56	Morocco
12	Burma	MZ	Mozambique
18	Canada	64	Netherlands
20	Chile	59	New Caledonia
21	China	61	New Zealand
22	Columbia	NI	Nigeria

:
:

RC	Congo	58	Norway
CR	Costa Rica	62	Pakistan
CU	Cuba	PA	Panama
DA	Dahomey	65	Peru
26	Denmark	66	Philippines
70	Dominican Republic	67	Poland
28	Ecuador	68	Portugal
27	Egypt	24	Republic of Korea
75	El Salvador	73	Romania
34	Finland	SE	Senegal
35	France	SL	Sierra Leone
96	German Democratic Republic	91	South Africa
06	Germany, Federal Republic of	29	Spain
GH	Ghana	SU	Sudan
36	Greece	86	Thailand
37	Guatemala	88	Tunisia
GU	Guinea	89	Turkey
38	Haiti	90	U.S.S.R.
HO	Honduras	74	United Kingdom
46	Iceland	ZA	United Republic of Tanzania
41	India	31	U.S.A.
42	Indonesia	32	U.S.A.
IN	Intergovernmental/International	99	Unknown
45	Ireland	92	Uruguay
47	Israel	93	Venezuela
48	Italy	94	Vietnam
IC	Ivory Coast	95	Yugoslavia

The country code was recommended by the seventh session of the Intergovernmental Oceanographic Commission Working Group on international oceanographic Data Exchange for incorporation in the Manual on International Oceanographic Data Exchange. Its maintenance and updating will be provided by the Intergovernmental Oceanographic Commission Working Group on International Data Exchange on a continuing basis.

Table 23
Duration and Time of Current Measurement (Vector Method) (K1)

Code Figure	Description
1	Instantaneous
2	Averaged over three minutes or less
3	Averaged over more than three minutes, but 6 six at the most
4	Averaged over more than 6 minutes, but 12 at the most
5	Instantaneous
6	Averaged over three minutes or less
7	Averaged over more than three minutes, but 6 at the most
8	Averaged over more than six minutes, but 12 at the most
9	Vector method not used

Note: H = Time of observation

:

Table 24
Period of Current Measurement (Drift Method) (K)

Code Figure	Description
1	One hour or less
2	More than one hour, but two at the most
3	More than four hours, but four at the most
4	More than four hours, but eight at the most
5	More than eight hours, but 12 at the most
6	More than 12 hours, but 18 at the most
7	More than 18 hours, but 24 at the most
8	Drift method not used

Table 25
Quality-Control Code for BATHY, TESAC and Drifting Buoy Data
Formatted for Metrological International Data Exchange

Code Figure	Description
0	Quality control check has not been made
1	Value found correct during quality control check
2	Value found to be suspect during quality control check
3	Value found to be erroneous during quality control check
4	Observed value was changed; the most likely value was inserted
9	Original value missing; no quality control was made

Table 26
Codes for ALPEX Data Tape Source

Code Figure	Data Tape Source
0001	WDC-A for Meteorology
0002	WDC-B for Meteorology
0021	International ALPEX Data Centre (IADC)
1001	SADC, Aircraft Dropwindsonde Data
1002	SADC, NAVAID Upper Air Data
1003	SADC, Mobile Ship Data
1004	SADC, AIDS Data
1005	SADC, Geostationary Satellite Winds (1)
1006	SADC, Geostationary Satellite Winds (2)
2001	SADC, Microbargraph Data
2002	SADC, Digital Radar Data
3001	NADC (1)
3002	NADC (2)

Note: Table needs to be completed (includes SADC's and NADC's, as applicable)

Table 27
Data Format Index

Code Figure	Description
00	Unused
01	Upper air format
02	Aircraft format
03	Surface land/marine format
04	Satellite sounding format

:
:

06	Satellite wind or sea surface temperature format
07	Oceanographic format
08	Drifting buoy format
90	3, 6 or 12 hourly precipitation format
91	Daily precipitation and snow format
92	Soil temperature and moisture format
93	Surface-based radiation format

Table 28
Quality Indicators for Sea Surface Temperature

Code Figure	Description
00	Not specified
01	High quality (data indicate absence or near absence of clouds in field of view)
02	Average quality (data indicate at least partly cloudy conditions in field of view)
03	Poor quality (data indicate mostly cloudy conditions in field of view)
04	High quality (quality parameter not specified)
05	Average quality (quality parameter not specified)
06	Poor quality (quality parameter not specified)

Table 29
Emissivity Used in Height Measurement

Code Figure	Description
0	Not specified
1	0.0-0.2 emissivity used in height measurement
2	0.21-0.3 emissivity used in height measurement
3	0.31-0.4 emissivity used in height measurement
4	0.41-0.5 emissivity used in height measurement
5	0.51-0.6 emissivity used in height measurement
6	0.61-0.7 emissivity used in height measurement
7	0.71-0.8 emissivity used in height measurement
8	0.81-0.9 emissivity used in height measurement
9	0.91-1.0 emissivity used in height measurement

Table 30
Subjective Confidence Factor

Code Figure	Description
0	Not specified
1	Low level of subjective confidence in observation
2	Medium level of subjective confidence in observation
3	High level of subjective confidence in observation

Table 31
Indicator or Type of Positioning Using ARGOS System

Code Figure	Description
0	Located not computed

:
:

1	Location computed using two passes of one satellite
2	Location computed using two passes, one from each of two satellites
3	Location computed using one pass only

Table 33
Type of Satellite Wind Derivation

Code Figure	Description
Information here needs to be supplied by producers of satellite wind data. Description should include sufficient information on type of image data used, subjective or objective tracking, technique for height determination, etc.	

Table 34
Cloud Classification

Code Figure	Description
0	Not specified
1	Single level of cirrus
2	Single of cumulus
3	Single level of stratus
4	Cumulonimbus
5	Cirrus over cumulus
6	Cumulus over cirrus
7	Cirrus over stratus
8	Stratus under cirrus
9	Multi-level clouds of undetermined types

Table 35
Significant Wind Field Point

Code Figure	Description
0	Not specified
1	Marked diffluent flow
2	Marked confluent flow
3	Uniform flow
4	Near centre of vortex
5	Near location of "col"
6	In area of marked horizontal shear
7	On axis of maximum wind (jet)
8	Suspected gravity wave movement

Table 38
Quality Control Indicator of Satellite Sounding Reports

Code Figure	Description
0	Quality control has not been made
1	Report was found correct during quality control
2	Report was found suspect during quality control
3	Report was found erroneous during quality control

Table 39
Indicator for Barometric Pressure Error Estimate

:
:

Code Figure	Description
00	Unknown or not applicable
01-99	Standard deviation form 0.1 mb to 9.9 mb

Table 40
Indicator for Sea Surface Temperature Error Estimate

Code Figure	Description
00	Unknown or not applicable
01-99	Standard deviation from 0.1°C to 9.9°C

Annex B

ALPEX Level II-b Tape Formats

Table 1
Upper Air Format

(a) Report Identification Record

Parameter	Number of Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See annex A, table 1
Block and station index (2)	5	4-8		WMO block and station index number
Station elevation (3)	4	9-12	Meters	
Latitude	5	13-17	10 ⁻² deg	North = positive
Longitude	5	18-22	10 ⁻² deg	West = positive East = negative
Instrument type	2	23-24	Code figure	See Annex A, Table 2
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Number of logical records in the report

Notes:

(1) For positive identification of the report identification record, the unique character * is always used.

(2) For ships, the ship identifier is stoned left-justified, blank-filled. If the name of the ship is unknown, the name SHIPb (where b is a blank) is used.

:
:

For aircraft dropwindsonde reports, the last five digits of the tail number is stored.

(3) Station elevation is the elevation of the pressure measuring instrument. For ship and aircraft dropwindsonde reports, this parameter is zero-filled.

(b) Upper Air Level Data Record

Parameter	Number of Characters	Position Number	Units	Remarks
Type of level	2	1-2	Code figure	See Annex A, Table 3
Pressure	5	3-7	10^{-1} mb	
Height	5	8-12	Gpm	Above sea level = + Below sea level = -
Quality control: height	2	13-14	Code figure	See Annex A, Table 4
Temperature	4	15-18	10^{-1} C	
Quality control: temperature	2	19-20	Code figure	See Annex A, Table 4
Dew point depression	4	21-24	10^{-1} C	
Quality control: dew point depression	2	25-26	Code figure	See Annex A, Table 4
Wind direction	3	27-29	Deg true	
Wind speed	3	30-32	m sec ⁻¹	
Quality control: wind	2	33-34	Code figure	See Annex A, Table 4
Record number	3	35-37		Record number within the report

(c) Cloud Data Record

Parameters	Number of Characters	Position Number	Units	Remarks
Type of level	2	1-2	Code figure	See Annex A, Table 4
Amount of Cl or Cm clouds (Nh)	2	3-4	Oktas	WMO code table 2700
Clouds of genera Sc, St, Cu, Cb	2	5-6	Code figure	WMO code table 0513
Height of the base of cloud (h)	2	7-8	Code figure	WMO code table 1600
Clouds of genera Ac, As, Ns (Cm)	2	9-10	Code figure	WMO code table 0515
Clouds of genera Ci, Cc, Cs (Ch)	2	11-12	Code figure	WMO code table 0509
Unused	22	13-34		
Record number	3	35-37		Record number within the report

**Table 2
Aircraft Format**

:
:

(a) Report Identification Record

Parameter	Number Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See Annex A, Table 1
Aircraft identification (2)	6	4-9		First 6 alphanumeric characters of aircraft identification
Type of wind report	1	10		0 = spot; 1 = mean; 9 = unknown
Number of wind reports	2	11-12		
Latitude	5	13-17	10 ⁻² deg	North = positive
Longitude	5	18-22	10 ⁻² deg	West = negative East = positive
Optional record indicator	1	23		0 = optional data record not included; 1 = included
Type of quality check	1	24		0 = no quality check; 1 = horizontal control check made; 2 = check against certain limits made
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Number of logical records in the report

Notes:

- (1) For positive identification of the report identification record, the unique character * is always used.
- (2) The aircraft identifier is stored left-justified, blank-filled. If the aircraft identifier is not known, the name AIRCFT is used.

(b) First aircraft data record (mandatory)

Parameter	Number of Characters	Position Number	Units	Remarks
Pressure	4	1-4	Mb	At flight altitude
Quality control: Pressure	1	5	Code figure	See Annex A, Table 4
Height	5	6-10	Meters	Pressure altitude
Quality control: height	1	11	Code figure	See Annex A, Table 4
Temperature	4	12-15	10 ⁻¹ C	At flight altitude
Quality control: temperature	1	16	Code figure	See Annex A, Table 4
Turbulence	2	17-18	Code	See Annex A, Table 5

:
:
:

			figure	
Icing	2	19-20	Code figure	See Annex A, Table 6
D-value	5	21-25	Meters	
Temperature	4	26-29	10^{-1} C	At nearest standard isobaric surface (CODAR only)
Height	5	30-34	Meters	At nearest standard isobaric surface (CODAR only)
Record number	3	35-37		Record number within the report

(c) Second aircraft data record (mandatory)

Parameter	Number of Characters	Position Number	Units	Remarks
Type of wind 1	2	1-2		0 = spot; 1 = mean; 9 = unknown
Latitude of wind 1	4	3-6	10^{-1} deg	North = positive
Longitude of wind 1	4	7-10	10^{-1} deg	West = negative East = positive
Direction of wind 1	3	11-13	Deg true	
Speed of wind 1	3	14-16	m sec $^{-1}$	
Quality control: wind 1	1	17	code figure	See Annex, Table 4
Type of wind 2	2	18-19		0 = spot; 1 = mean; 9 = unknown
Latitude of wind 2	4	20-23	10^{-1} deg	North = positive
Longitude of wind 2	4	24-27	10^{-1} deg	West = negative East = positive
Direction of wind 2	3	28-30	Deg true	
Speed of wind 2	3	31-33	m sec $^{-1}$	
Quality control: wind 2	1	34	code figure	See Annex, Table 4
Record number	3	35-37		Record number within the report

Note: If aircraft report contains more than 2 wind reports, this data record is repeated. Wind 1 becomes wind 3, and wind 2 becomes wind 4, etc.

(d) Optional aircraft data record

Parameter	Number of Characters	Position Number	Units	Remarks
Weather phenomena	2	1-2	Code figure	See Annex A, Table 7
Cloud amount and base or top	2	3-4	Code figure	See Annex A, Table 8
Height or base or top	5	5-9	meters	

:
:

Unused	25	10-34		
Record	3	35-37		Record number within the report

Note: This logical record may or may not be included, depending on the availability of the information in the aircraft report. If included, this record will always be the last record in the report.

Table 3
Surface Land/Marine Format

(a) Report identification Record

Parameter	Number of Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See Annex A, Table 1
Block and station index (2)	5	4-8		WMO block and station number
Station elevation (3)	4	9-12	Meters	
Latitude	5	13-17	10^{-2} deg	North = positive
Longitude	5	18-22	10^{-2} deg	West = positive East = negative
Instrument type (4)	2	23-24	Code figure	See Annex A, Type 2
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Land report = 3 or 4 records; Ship report = 4 or 5 records

Notes:

(1) For positive identification of the report identification record, the unique character * is always used.

(2) In the case of a ship or environmental buoy, the first 5 characters which identify the ship or buoy are recorded (see note 3 also). If the name contains less than 5 characters, the name is stored left-justified, blank-filled. For unknown names, SHIPb or BUOYb is stored.

(3) For SHIP or BUOY names with more than 5 characters, the additional characters are stored here left-justified, blank-filled. For names with 5 or less characters, all 4 characters of this parameter are blank-filled.

(4) 99 is used for land report. For SHIP or BUOY report, instrument type indicates the type of wind observation and the mode of collection.

(b) First Surface Data Record

:
:

Parameter	Number of Characters	Position Number	Units	Remarks
Total cloud amount (N)	2	1-2	Oktas	WMO code table 2700
Wind direction (dd)	3	3-5	Deg true	990 = variable direction
Wind speed (ff)	3	6-8	M sec ⁻¹	
Quality control: wind	1	9	Code figure	See Annex A, Table 9
Horizontal visibility (vv)	2	10-11	Code figure	WMO code table 4377
Present weather (ww)	2	12-13	Code figure	WMO code table 4677
Past weather (W1)	1	14)	Code figure	WMO code table 4561
(W2)	1	15)		WMO code table 4561
Pressure code indicator	1	16	Code figure	See Annex, table 10
Sea level pressure, station pressure, or height	5	17-21	10 ⁻¹ mb or gpm	See character position 16
Quality control: pressure or height	1	22	Code figure	See Annex A, Table 9
Air temperature	4	23-26	10 ⁻¹ C	
Quality control: temperature	1	27	Code figure	See Annex A, table 8
Amount of Cl or Cm clouds (Nh)	2	28-29	Oktas	WMO code table 2700
Clouds of genera Sc, St, Cu, Cb	2	30-31	Code figure	WMO code table 0513
Height of the base of cloud (h)	2	32-33	Code figure	WMO code table 1600
Clouds of genera Ac, As, Ns (Cm)	2	34-35	Code figure	WMO code table 0515
Clouds of genera Ci, Cc, Cs (Ch)	2	36-37	Code figure	WMO code table 0509

Notes: The following allows for the coding of missing data in this category:

If W1 exists and W2 exists; use WMO regulations as is (W2 ≤ W1 ≤ 9)

If W1 exists and W2 is missing; codes as W1 (≤ 9)

If W1 is missing and W2 exists; code as W2 (≤ 9)

If W1 is missing and W2 is missing; code as -9

(c) Second Surface Data Record

Parameter	Number of Characters	Position Number	Units	Remarks
Dew point depression	3	1-3	10 ⁻¹ C	
Quality control: Dew point depression	1	4	Code figure	See Annex A, table 9
Indicator for pressure tendency time period	1	5	Code figure	See Annex A, Table 12

:

Characteristic of pressure tendency (a)	2	6-7	Code figure	WMO code table 0200 (for 24-hour tendency, code figures 4-9 are used)
Magnitude of pressure tendency (ppp)	3	8-10	10 ⁻¹ mb	
Quality control: pressure tendency	1	11	Code figure	See Annex A, Table 9
Indicator for precipitation time period	1	12	Code figure	See Annex A, Table 12
Precipitation amount	4	13-16	10 ⁻¹ mm	Trace = 001; more than 400 mm = 4001
Indicator for maximum temperature time period	1	17	Code figure	See Annex A, Table 12
Maximum temperature	4	18-21	10 ⁻¹ C	
Indicator for minimum temperature time period	1	22	Code figure	See Annex A, Table 12
Minimum temperature	4	23-26	10 ⁻¹ C	
Quality control: Time consistency	1	27	Code figure	See Annex A, Table 11
Quality control: Internal consistency	1	28	Code figure	See Annex A, Table 12
Quality control: Meteorological limits	1	29	Code figure	See Annex A, Table 12
Quality control: Physical limits	1	30	Code figure	See Annex A, Table 12
Quality control: Zonal limits	1	31	Code figure	See Annex A, Table 12
Unused	6	32-37		

(d) Surface Supplementary Cloud Data Record

Parameter	Number of Characters	Position Number	Units	Remarks
Significant cloud amount (Ns)	2	1-2	Oktas	WMO code table 2700
Significant cloud type (C)	2	3-4	Code figure	WMO code table 0500
Significant cloud height (hshs)	2	5-6	Code figure	WMO code table 1677
Significant cloud amount (Ns)	2	7-8	Oktas	WMO code table 2700
Significant cloud type (C)	2	9-10	Code figure	WMO code table 0500
Significant cloud height (hshs)	2	11-12	Code figure	WMO code table 1677
Significant cloud amount (Ns)	2	13-14	Oktas	WMO code table 2700
Significant cloud	2	15-16	Code	WMO code

:
:

type (C)			figure	table 0500
Significant cloud height (hshs)	2	17-18	Code figure	WMO code table 1677
Significant cloud amount (Ns)	2	19-20	Oktas	WMO code table 2700
Significant cloud type (C)	2	21-22	Code figure	WMO code table 0500
Significant cloud height (hshs)	2	23-24	Code figure	WMO code table 1677
Unused	13	25-37		

(e) Additional Surface Data Record for Marine Report

Parameters	Number of Characters	Position Number	Units	Remarks
Period of wind waves (PwPw)	2	1-2	Seconds	
Height of wind waves (HwHw)	2	3-4	0.5 m	Scaled to 0.5 m (e.g., 20=20 x 0.5 m = 10 m)
Direction of swell (dwdw)	2	5-6	Code figure	WMO code table 0877
Period of swell (Pw)	2	7-8	Code figure	WMO code table 3155
Height of swell (HwHw)	2	9-10	0.5 m	(see positions 3-4)
Direction of swell (dwdw)	2	11-12	Code figure	WMO code table 0877
Period of swell (Pw)	2	13-14	Code figure	WMO code table 3155
Height of swell (HwHw)	2	15-16	0.5 m	(see positions 3-4)
Sea surface temperature	4	17-20	10 ⁻¹ C	
Quality control: sea surface temperature	1	21	Code figure	See Annex A, table 9
Ship's course during past 3 hours (Ds)	2	22-23	Code figure	WMO code table 0700
Ship's average speed during past 3 hours (Vs)	2	24-25	Code figure	WMO code table 4451
Ice accretion on ship (Is)	2	26-27	Code figure	WMO code table 1751
Thickness of ice accretion on ship (EsEs)	2	28-29	Cm	
Rate of ice accretion on ship (Rs)	2	30-31	Code figure	WMO code table 3551
Quality control: ship position	1	32	Code figure	See Annex A, Table 9
Unused	5	33-37		

:
:

Note: The WMO Manual on Codes identifies Pw as wave period. Actually, this parameter represents period of swell.

Table 4
Satellite Sounding Format

(a) Report Identification Record

Parameter	Number of Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See Annex A, Table 1
Unused	5	4-8		
Indicator for data processing technique used	2	9-10	Code figure	See Annex A, Table 15 (for sounding data)
Indicator for data processing technique used	2	11-12	Code figure	See Annex A, Table 16 (for tropopause data)
Latitude	5	13-17	10 ⁻² deg	North = positive
Longitude	5	18-22	10 ⁻² deg	West = negative East = positive
Instrument type	2	23-24	Code figure	See Annex A, table 2
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Number of logical records in the report

Notes:

(1) For positive identification of the report identification record, the unique character * is always used.

(b) Miscellaneous Satellite Sounding Data Record
(Second record of Satellite Sounding Report)

Parameter	Number of Characters	Position Number	Units	Remarks
Type of sounding level	2	1-2	Code figure	See Annex A table 13
Percentage of effective cloud cover 1	2	3-4	Percent	
Pressure of effective cloud cover 1	3	5-7	Mb	Pressure at average cloud top of effective cloud cover 1
Percentage of	2	8-9	Percent	

:
:

effective cloud cover				
Pressure of effective cloud cover	3	10-12	Mb	Pressure at average cloud top of effective cloud cover 2
Tropopause pressure	4	13-16	10^{-1} C	
Tropopause temperature	3	17-19	Deg C	Sign in position 17
Index of accuracy for tropopause data	2	20-21	Mb	
Surface temperature	3	22-24	Deg C	Sign in position 22
Number of reported thickness layers	2	25-26		From SATEM, parts A and C
Number of reported precipitable water layers	2	27-28		From SATEM, part A
Number of reported mean temperature layers	2	29-30		From SATEM, Parts B and D
Number of reported precipitable water layers	2	31-32		From SATEM, Part B
Unused	1	33		
Quality control indicator	1	34	Code figure	See Annex, Table 38
Record number	3	35-37		Record number within the report (always 2)

**(c) Optional Record for Satellite Sounding Thickness Data
(SATEM Code - Parts A and C)**

Parameter	Number of Characters	Position Number	Units	Remarks
Type of sounding level	2	1-2	Code figure	See Annex A, Table 13
Objective thickness quality indicator	2	3-4	Gpm	
Pressure at reference level	5	5-9	10^{-1} mb	Reference level fixed for all thickness layers
Pressure at standard isobaric surface	5	10-14	10^{-1} mb	
Layer thickness	4	15-18	10 gpm	
Objective thickness quality indicator	2	19-20	gpm	
Pressure at reference level	5	21-25	10^{-1} mb	(see positions 5-9)
Pressure at standard isobaric	5	26-30	10^{-1} mb	

:
:

surface				
Layer thickness	4	31-34	10 gpm	
Record number	3	35-37		Record number within the report

**(d) Optional record for Satellite Sounding Precipitable Water Data
(SATEM Code - Part A)**

Parameter	Number of Characters	Position Number	Units	Remarks
Type of sounding level	2	1-2	Code figure	See Annex A, table 13
Index of accuracy for precipitable water	2	3-4	Percent	Percent of derived value
Pressure at reference level	5	5-9	10^{-1} mb	Reference level fixed for all precipitable water values
Pressure at standard isobaric surface	5	10-14	10^{-1} mb	
Layer precipitable water	4	15-18	mm	
Index of accuracy for precipitable water	2	19-20	Percent	Percent of derived value
Pressure at reference level	5	21-25	10^{-1} mb	(see positions 5-9)
Pressure at standard isobaric surface	5	26-30	10^{-1} mb	
Layer precipitable water	4	31-34	mm	
Record number	3	35-37		Record number within the report

**(e) Optional Record for Satellite Mean temperature Data
(SATEM Code - Parts B and D)**

Parameter	Number of Characters	Position Number	Units	Remarks
Type of sounding level	2	1-2	Code figure	See Annex A, table 13
Objective mean temperature quality indicator	2	3-4	10^{-1} C	
Pressure at lower non-standard isobaric surface	5	5-9	10^{-1} mb	
Pressure at upper non-standard isobaric surface	5	10-14	10^{-1} mb	
Layer mean temperature	4	15-18	10^{-1} C	
Objective mean temperature quality	2	19-20	10^{-1} C	

:
:

indicator				
Pressure at lower non-standard isobaric surface	5	21-25	10^{-1} mb	
Pressure at upper non-standard isobaric surface	5	26-30	10^{-1} mb	
Layer mean temperature	4	31-34	10^{-1} C	
Record number	3	35-37		Record number within the report

**(f) Optional Record for Satellite Sounding Precipitable Water Data
(SATEM Code - Part B)**

Parameter	Number of Characters	Position Number	Units	Remarks
Type of sounding level	2	1-2	Code figure	See Annex A, table 13
Index of accuracy for precipitable water	2	3-4	Percent	Percent of derived value
Pressure at lower non-standard isobaric surface	5	5-9	10^{-1} mb	
Pressure at upper non-standard isobaric surface	5	10-14	10^{-1} mb	
Layer precipitable water	4	15-18	mm	
Index of accuracy for precipitable water	2	19-20	Percent	Percent of derived value
Pressure at lower non-standard isobaric surface	5	21-25	10^{-1} mb	
Pressure at upper non-standard isobaric surface	5	26-30	10^{-1} mb	
Layer precipitable water	4	31-34	mm	
Record number	3	35-37		Record number within the report

**Table 5
Satellite Wind or Sea Surface Temperature Format**

(a) Report Identification Record

Parameter	Number of Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See Annex A, Table 1
Indicator for data	2	4-5	Code	See Annex A,

:
:

processing technique used			figure	Table 18
Unused	2	6-22		
Instrument type	2	23-24	Code figure	See Annex A, table 2
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Number of logical records in the report

Notes:

- (1) For positive identification of the report identification record, the unique character * is always used.
- (2) For sea surface temperature, this represents the major synoptic time for the six-hour data period. The actual time of observation is appended to the individual temperature observation.

(b) Record for Sea Surface Temperature Data

Parameter	Number of Characters	Position Number	Units	Remarks
Hour of observation	2	1-2		00-23 GMT
Minutes of observation	2	3-4		00-59
Latitude	4	5-8	10 ⁻¹ deg	North = positive
Longitude	5	9-12	10 ⁻¹ deg	West = negative East = positive
Sea surface temperature	4	13-16	10 ⁻¹ C	
Quality indicator	2	17-18	Code figure	See Annex A, Table 28
Hour of observation	2	19-20		00-23 GMT
Minutes of observation	2	21-22		00-59
Latitude	4	23-26	10 ⁻¹ deg	North = positive
Longitude	5	27-30	10 ⁻¹ deg	West = negative East = positive
Sea surface temperature	4	31-34	10 ⁻¹ C	
Quality indicator	2	35-36	Code figure	See Annex A, Table 28
Unused	1	37		

(c) Record for Wind and Temperature Data

:
:

Parameter	Number of Characters	Position Number	Units	Remarks
Latitude	4	1-4	10 ⁻¹ deg	North = positive
Longitude	4	5-8	10 ⁻¹ deg	West = negative East = positive
Type of satellite wind derivation	2	9-10	Code figure	See Annex A, Table 33
Pressure	3	11-13	Mb	At effective wind level
Subjective pressure confidence factor	1	14	Code figure	See Annex A, Table 30
Unused	1	15		
Temperature	3	16-18	Deg C	
Wind direction	3	19-21	Deg true	
Wind speed	3	22-24	Mps	
Subject wind direction confidence factor	1	25	Code figure	See Annex A, Table 30
Subjective wind speed confidence factor	1	26	Code figure	See Annex A, Table 30
Objective estimate of vector error	2	27-28	Mps	Unspecified = 99
Objective estimate of pressure error	2	29-30	Cb	Unspecified = 99
Fleet identifier number	2	31-32		00 = independent; 01 = first fleet; 02 = second fleet; etc
Emissivity used in height measurement	1	33	Code figure	See Annex A, Table 29
Pressure difference between cloud top and effective wind level	2	34-35	Cb	Unspecified = 99
Cloud classification	1	36	Code figure	See Annex A, Table 34
Significant wind field point	1	37	Code figure	See Annex A, Table 35

**Table 6: Oceanographic Format
(a) Report Identification Record**

Parameter	Number of Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See Annex A, Table 1
Bulletin information	5	4-8		Deck 0004 = blanks
GTS station call sign	5	9-12		Deck 0004 = blanks
Latitude	5	13-17	10 ⁻² deg	North = positive
Longitude	5	18-22	10 ⁻²	West = negative

:
:

			deg	East = Positive
Instrument type	2	23-24	Code value	Deck 0001 = blanks Deck = 0004 = 02 (XBT)
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Number of logical records in the report

Notes:

(1) For positive identification of the report identification record, the unique character * is always used.

**(b) Additional Oceanographic Identification record
(Second Record in the Report)**

Parameter	Number of Characters	Position Number	Units	Remarks
Deck number	4	1-4	Code figure	See Annex A, table 19
Reference identity number	5	5-9		Deck 0001 = blanks; Deck 004 = NCDC reference number
Consecutive observation number	4	10-13		Deck number 0001 = blanks; Deck 0004 = NCDC number
IOC country code	2	14-15	Code figure	See Annex A, Table 22
Platform identification	7	16-22		Deck 0001 = ship call sign; Deck 0004 = NODC code
Platform code system	1	23		Deck 0001 = blank Deck 0004 = 1
Platform type	1	24		Blank
Institution code	3	25-27		Deck 0001 = blanks; Deck 0004 = NODC code or blanks
Originator's stations number	7	28-34		Station number or other designator
Record number	3	35-37		Record number within the report

Note: This logical record is always the second record in an oceanographic report.

(c) Miscellaneous Oceanographic Data Record

:
:

(Third Record in the Report)

Parameter	Number of Characters	Position Number	Units	Remarks
Originator's cruise number	8	1-8		Deck 0001 = blanks; Deck 0004 = alphanumeric
Project or expedition designator	8	9-16		Deck 0001 = IGOSS (left-justified; Deck 0004 = blanks
Bottom depth	4	17-20	Meters	Depth at which instrument hits bottom
Bottom temperature	5	21-25	10^{-2} C	
Bottom salinity	4	26-29	10^{-2} parts per thousand	TESAC only
Depth to sea bottom	5	30-34	Meters	
Record number	3	35-57		Record number within the report

Note: This logical record is always the third record in an oceanographic report.

(d) Miscellaneous Oceanographic Data Record
(Fourth Record in the Report)

Parameter	Number of Characters	Position Number	Units	Remarks
Number of significant depths	4	1-4		
Number of standard depths	4	5-8		
Number of current depths	4	9-12		TESAC only
Multi-sensor codes	10	13-22		TESAC only
Originator's observation number	4	23-26		
Transmission status	1	27		
Air temperature	4	28-31	10^{-1} C	
Solar radiation	3	32-34	10^{-2} langley's per minute	
Record number	3	35-37		Record number within the report

Note: This logical record is always the fourth record in an oceanographic report.

(e) Environmental Data Record
(Fifth Record in the Report)

:
:

Parameter	Number of Characters	Position Number	Units	Remarks
Surface wind direction	3	1-2	Degrees	Reported value given to nearest 10 degrees
Surface wind speed	2	4-5	M sec ⁻¹	
Sea level pressure	5	6-10	10 ⁻¹ mb	
Air wet-bulb temperature	4	11-14	10 ⁻¹ C	
Sea surface temperature	4	15-18	10 ⁻¹ C	
Sea surface temperature instrument indicator	2	19-20	Code figure	See Annex A, table 2
Wind wave period	2	21-22	Seconds	Calm = 00; Undetermined = 99
Wind wave height	2	23-24	0.5 m	
Swell period	2	25-26	Code figure	WMO code table 3155
Swell wave height	2	27-28	0.5 m	
Swell direction	2	29-30	10 deg	Direction from which swell is coming
Precipitation	3	31-33	0.2 mm	6-hour amount preceding synoptic hour
Unused	1	34		
Record number	3	35-37		Record number within the report

Note: This logical record is always the fifth record in an oceanographic report.

**(f) Miscellaneous Oceanographic Data Record
(Sixth Record in the Report)**

Parameter	Number of Characters	Position Number	Units	Remarks
ODAS designator	4	1-4		Presently blanks
ODAS category	1	5	Code figure	See Annex A, table 21
Data designator	1	6		
Water transparency	2	7-8	Meters	
Unused	26	9-34		
Record number	3	35-37		Record number within the report

Note: This logical record is always the sixth record in an oceanographic report.

(g) Oceanographic Data Record - BATHY (Temperature, Depth)

Parameter	Number of Characters	Position Number	Units	Remarks
-----------	----------------------	-----------------	-------	---------

:
:

Data type	1	1	Code figure	See Annex A, Table 20
Depth 1	4	2-5	Meters	
Quality control: depth 1	1	6	Code figure	See Annex A, Table 25
Temperature at depth 1	4	7-10	10^{-1} C	
Quality control: temperature 1	1	11	Code figure	See Annex A, Table 25
Temperature at depth 2	4	12-15	10^{-1} C	
Quality control: temperature 2	1	16	Code figure	See Annex A, Table 25
Temperature at depth 2	4	17-20	10^{-1} C	
Quality control: temperature 2	1	21	Code figure	See Annex A, Table 25
Temperature at depth 3	4	22-25	10^{-1} C	
Quality control: temperature 3	1	26	Code figure	See Annex A, Table 25
Temperature at depth 3	4	27-30	10^{-1} C	
Quality control: temperature 3	1	31	Code figure	See Annex A, Table 25
Unused	3	32-34		
Record number	3	35-37		Record number within the report

Note: This record is repeated as many times as necessary.

**(h) Oceanographic Data Record - TESAC
(Temperature, Salinity, Depth)**

Parameter	Number of Characters	Position Number	Units	Remarks
Data type	1	1	Code figure	See Annex A, Table 20
Depth 1	4	2-5	Meters	
Quality control: depth 1	1	6	Code figure	See Annex A, Table 25
Temperature at depth 1	4	7-11	10^{-2} C	
Quality control: temperature 1	1	12	Code figure	See Annex A, Table 25
Salinity at depth 2	4	13-16	10^{-2} parts per thousand	
Quality control: salinity 2	1	17	Code figure	See Annex A, Table 25
Depth 2	4	18-21	Meters	
Quality control: Depth 2	1	22	Code figure	See Annex A, Table 25
Temperature at depth 2	4	23-27	10^{-2} C	
Quality control:	1	28	Code figure	See Annex A,

:
:

temperature 2				Table 25
Salinity at depth 2	4	29-32	10 ⁻² parts per thousand	
Quality control: salinity 2	1	33	Code figure	See Annex A, Table 25
Unused	3	34		
Record number	3	35-37		Record number within the report

Note: This record is repeated as many times as necessary.

**(i) Oceanographic Data Record - TESAC
(Current, Depth)**

Parameter	Number of Characters	Position Number	Units	Remarks
Data type	1	1	Code figure	See Annex A, Table 20
Duration/time of current measurement	1	2	Code figure	See Annex A, Table 23
Period of current measurement 1	1	3	Code figure	See Annex A, Table 24
Instrument type 1	2	4-5		Blanks
Depth 1	4	6-9	Meters	
Quality control: Depth 1	1	10	Code figure	See Annex A, Table 25
Current direction 1	2	11-12	10 deg	
Current speed 1	3	13-15	cm sec ⁻¹	
Quality control: current 1	1	16		See Annex A, Table 25
Duration/time of current measurement 2	1	17	Code figure	See Annex A, Table 23
Period of current measurement 2	1	18	Code figure	See Annex A, Table 24
Instrument type 2	2	19-20		Blanks
Depth 2	4	21-24	Meters	
Quality control: Depth 2	1	25	Code figure	See Annex A, Table 25
Current direction 2	2	26-27	10 deg	(see positions 11-12)
Current speed 2	3	28-30	Cm sec ⁻¹	
Quality control: current 2	1	31	Code figure	See Annex A, Table 25
Unused	3	32-34		
Record number	3	35-37		Record number within the report

Note: This record is repeated as many times as necessary.

**Table 7
Drifting Buoy Format**

:
:

(a) Report identification Record

Parameter	Number of Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See Annex A, Table 1
Buoy number (2)	5	4-8		
Wind indicator	2	9-10	Code figure	WMO code table 1855
Indicator for surface data record (3)	2	11-12		0 = included in report; 1 = not included in report
Latitude	5	13-17	10^{-2} deg	North = positive
Longitude	5	18-22	10^{-2} deg	West = negative East = Positive
Number of sub-surface data records	2	23-24		
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Number of logical records in the report

Notes:

- (1) For positive identification of the report identification record, the unique character * is always used.
- (2) The buoy number reported in the WMO DRIBU Code is used.
- (3) If indicator = 0, the surface data record is the second in the report, and sub-surface data are stored in the third and subsequent records. If indicator = 1, the surface data record is omitted.

(b) Drifting Buoy Surface Data Record

Parameter	Number of Characters	Position Number	Units	Remarks
Sea level pressure	5	1-5	10^{-1} mb	
Quality control: Pressure	1	6	Code figure	See Annex, table 9
Air temperature	4	7-10	10^{-1}	
Quality control: Air temperature	1	11	Code figure	See Annex, table 9
Sea surface temperature	4	12-15	10^{-1} C	
Quality control: Sea surface temperature	1	16	Code figure	See Annex, table 9
Wind direction	3	17-19	Deg true	

:
:

Wind speed	3	20-22	M sec ⁻¹	
Quality control: wind	1	23	Code figure	See Annex, table 9
Quality control: time consistency	1	24	Code figure	See Annex, table 11
Quality control: internal consistency	1	25	Code figure	See Annex, table 11
Quality control: climatological limits	1	26	Code figure	See Annex, table 11
Quality control: Physical limits	1	27	Code figure	See Annex, table 11
Quality control: horizontal limits	1	28	Code figure	See Annex, table 11
Quality control: buoy location	1	29	Code figure	See Annex, table 31
Indicator of barometric pressure error	2	30-31	Code figure	See Annex, table 39
Indicator for sea surface temperature error	2	32-33	Code figure	See Annex, table 40
Unused	1	34		
Record number	3	35-37		Record number within the report

(c) Drifting Buoy Sub-Surface Data Record

Parameter	Number of Characters	Position Number	Units	Remarks
Depth 1	4	1-4	Meters	
Quality control: Depth 1	1	5	Code figure	See Annex A, Table 25
Temperature at Depth 1	4	6-9	10 ⁻¹ C	
Quality control: temperature 1	2	10-11	Code figure	See Annex A, Table 25
Depth 2	4	12-15	Meters	
Quality control: depth 2	1	16	Code figure	See Annex A, Table 25
Temperature at depth 2	4	17-20	10 ⁻¹ C	
Quality control: temperature	2	21-22	Code figure	See Annex A, Table 25
Depth 3	4	23-26	Meters	
Quality control: depth 3	1	27	Code figure	See Annex A, Table 25
Temperature at depth 3	4	28-31	10 ⁻¹ C	
Quality control: temperature 3	2	32-33	Code figure	See Annex A, Table 25
Indicator for ocean bottom layer temperature (1)	1	34		0 = bottom layer, 1 = not bottom layer
Record number	3	35-37		Record number within the report

:
:

Note: (1) Indicator denotes whether or not the reported temperature at the lowest depth of the sounding is actually the bottom layer temperature.

**Table 8:
Daily Precipitation Total and Snow Data Format**

(a) Report Identification Record

Parameter	Number of Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See Annex A, Table 1
Block and station index (2)	5	4-8		
Station elevation	2	9-12	Meters	
Latitude	5	13-17	10 ⁻² deg	North = positive
Longitude	5	18-22	10 ⁻² deg	West = negative East = Positive
Instrument type	2	23-24	Code figure	See Annex A, Table 2
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Number of logical records in the report

Notes: (1) For positive identification of the report identification record, the unique character * is always used.
(2) For ships, the ship identifier is stored left-justified, blank-filled. If the name of the ship is unknown, the name SHIPb (where b is a blank) is used. For aircraft dropwindsonde reports, the last five digits of the tail number is stored.
(3) Station elevation is the elevation of the pressure measuring instrument. For ship and aircraft dropwindsonde reports, this parameter is zero-filled.

(b) Daily Precipitation and Snow Data Record

Parameter	Number of Characters	Character Position	Units	Remarks
25 hours total precipitation	4	1-4	10 ⁻¹ mm	
Ending time of precipitation observation	1	5	Code figure	See Annex A, Table 1A
Snow cover	1	6		0 = no; 1 = yes
Snow depth	5	7-11	mm	
Water equivalent of	5	12-16	10 ⁻¹ mm	

:
:

snow				
Unused	18	17-34		
Record number	3	35-37		Record number within the report (=2)

Table 9
3-Hourly Precipitation Data Format

(a) Report Identification Record

Parameter	Number of Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See Annex A, Table 1
Block and station index (2)	5	4-8		
Station elevation	2	9-12	Meters	
Latitude	5	13-17	10^{-2} deg	North = positive
Longitude	5	18-22	10^{-2} deg	West = negative East = Positive
Instrument type	2	23-24	Code figure	See Annex A, Table 2
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Number of logical records in the report

Notes:

- (1) For positive identification of the report identification record, the unique character * is always used.
- (2) The aircraft identifier is stored left-justified, blank-filled. If the aircraft identifier is not known, the name AIRCFT is used.

(b) 3, 6 or 12-Hourly Precipitation Data Record

Parameter	Number of Characters	Character Positions	Units	Remarks
First precipitation period	4	1-4	10^{-1} mm	
Second precipitation period	4	5-8	10^{-1} mm	
Third precipitation period	4	9-12	10^{-1} mm	Not used for 12-hourly data
Fourth	4	13-16	10^{-1}	Not used for 12-

:
:

precipitation period			mm	hourly data
Fifth precipitation period	4	17-20	10^{-1} mm	Not used for 6 and 12-hourly data
Sixth precipitation period	4	21-24	10^{-1} mm	Not used for 6 and 12-hourly data
Seventh precipitation period	4	25-28	10^{-1} mm	Not used for 6 and 12-hourly data
Eighth precipitation period	4	29-32	10^{-1} mm	Not used for 6 and 12-hourly data
Unused	2	33-34		
Record number	3	35-37		Record number within the report (=2)

Table 10
Soil Temperature and Soil Moisture Format

(a) Report Identification Record

Parameter	Number of Characters	Position Number	Units	Remarks
Report identification flag (1)	1	1		Unique character - *
Data source index	2	2-3	Code figure	See Annex A, Table 1
Block and station index (2)	5	4-8		
Station elevation	2	9-12	Meters	
Latitude	5	13-17	10^{-2} deg	North = positive
Longitude	5	18-22	10^{-2} deg	West = negative East = Positive
Number of soil temperature records	1	23		
Number of soil moisture records	1	24		
Year	2	25-26		82 = 1982
Month	2	27-28		01-12 = January-December
Day	2	29-30		01-31
Hour	2	31-32		00-23 GMT
Minute	2	33-34		00-59
Number of logical records	3	35-37		Number of logical records in the report

Notes:

- (1) For positive identification of the report identification record, the unique character * is always used.
- (2) If a WMO Block/Station Index Number is not available, these character positions will be filled with the station name abbreviated to 5 characters.

:

:

(b) Data Record for Soil Temperature Observations

Parameter	Number of Characters	Character Position	Units	Remarks
Time of observation	4	1-4	Hours and minutes	GMT
Dry bulb temperature	3	5-7	10 ⁻¹ C	
Relative humidity	2	8-9	Percent	00 = 100
Depth 1	3	10-12	cm	000 = surface
Soil Temperature 1	3	13-15	10 ⁻¹ C	
Depth 2	3	16-18	cm	
Soil Temperature 2	3	19-21	10 ⁻¹ C	
Depth 3	3	22-24	cm	
Soil Temperature 3	3	25-27	10 ⁻¹ C	
Depth 4	3	28-30	cm	
Soil temperature 4	3	31-33	10 ⁻¹ C	
Unused	1	34		
Record number	3	35-37		Record number within the report

(c) Data Record for Soil Moisture Observations

Parameter	Number of Characters	Character Position	Units	Remarks
Time of observation	4	1-4	Hours and minutes	GMT
Depth 1	3	5-7	cm	000 = surface
Soil moisture content 1	3	8-10	10 ⁻¹ Percent	
Depth 2	3	11-13	cm	
Soil moisture content 2	3	14-16	10 ⁻¹ percent	
Depth 3	3	17-19	cm	
Soil moisture content 3	3	20-22	10 ⁻¹ percent	
Depth 4	3	23-25	cm	
Soil moisture 4	3	26-28	10 ⁻¹ percent	
Unused	6	29-34		
Record number	3	35-37		Record number within the report

5. **Start Date:** 19820301

6. **Stop Date:** 19820430

:
:

7. **Coverage:**

- a. Southernmost Latitude: 30.0N
- b. Northernmost Latitude: 60.0N
- c. Westernmost Longitude: 30.0W
- d. Easternmost Longitude: 37.0E

8. **How to Order Data:**

Ask NCDC's Climate Services about the cost of obtaining this data set.
Phone: 828-271-4800
FAX: 828-271-4876
E-mail: NCDC.Orders@noaa.gov

9. **Archiving Data Center:**

Archive Branch
National Climatic Data Center
151 Patton Avenue
Asheville, NC 28801

10. **Technical Contact:**

National Climatic Data Center
151 Patton Avenue
Asheville, NC 28801

11. **Known Uncorrected Problems:** None.

12. **Quality Statement:**

13. **Essential Companion Datasets:**

14. **References:**